Verification & Validation Summit

Human Perspective in V&V

Eric Neiderman, Ph.D., ANG-E2

Tanya Yuditsky, Ph.D., ANG-E25

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Federal Aviation Administration

Themes

- If you know,
  if you know your history…
- The meaty questions
- The mind of a tester
- Human Factors in the wild

- Summation

If you know,
if you know your history...

A History of Aviation V&V

Atlantic City Air Carnival
July 2 to July 12, 1910

A History of Aviation V&V

World Record for Altitude:

- **Walter Brookins (Wright Team)**
- **First pilot to fly over 1 mile high**
- **6,175 feet above boardwalk**
- **Won a $5,000 prize ($125k today)**

A History of Aviation V&V

World Record for Endurance:

- Glenn Curtiss
- Flew back and forth on shoreline for 50 miles
- Total time of 1 hour 14 minutes

A History of Aviation V&V

PROPOSED T & A FACILITIES

national aviation facilities experimental center

Atlantic City Aviation Firsts:

- Glenn Curtiss was the first to obtain a license for passenger flight.
- Two attempts to fly across the Atlantic were launched from Atlantic City (1910 and 1912)
- The word “Airport” was coined in Atlantic City in 1919.

The Meaty Questions

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Human Factors Requirements

1. Usability
2. Trainability
3. Maintainability

The Meaty Questions

What is the effect of variables X, Y, and Z on operator performance and how do they interact?

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Which of two designs, two sets of training manuals, two procedures (or anything else to be compared) produces more effective operator performance?

The Meaty Questions

How effective (in an absolute, quantitative sense) are systems, equipment, and personnel in performing missions, functions, and tasks?

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How do personnel feel about a system, equipment, phenomenon, or event; or what do they report about the way they performed; or how well they performed?

The Meaty Questions

Operational Effectiveness & Operational Suitability

How well does the solution satisfy the need?

How well will the product fit into the operation?

Human Factors Requirements

Research, Development, Test & Evaluation Process

Request

Needs Assessment

Agreement

Production / Test & Evaluation

Implementation

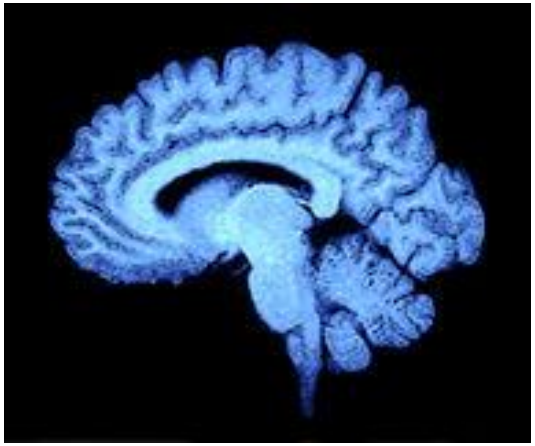
Feedback / Communication

Outcomes

Human Factors Requirements

Research, Development, Test & Evaluation Process

The Mind of a Tester



The Mind of a Tester

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Unbreakable Comb – Money Back Guarantee

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Human Factors in V&V

Background: Human Factors

Machine-Centered View

People	Machines
Vague	Precise
Disorganized	Orderly
Distractible	Undistractible
Emotional	Unemotional
Illogical	Logical

(Norman, 1998)

Background: Human Factors

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Human-Centered View

People	Machines
Creative	Unoriginal
Compliant	Rigid
Attentive to Change	Insensitive to Change
Resourceful	Unimaginative

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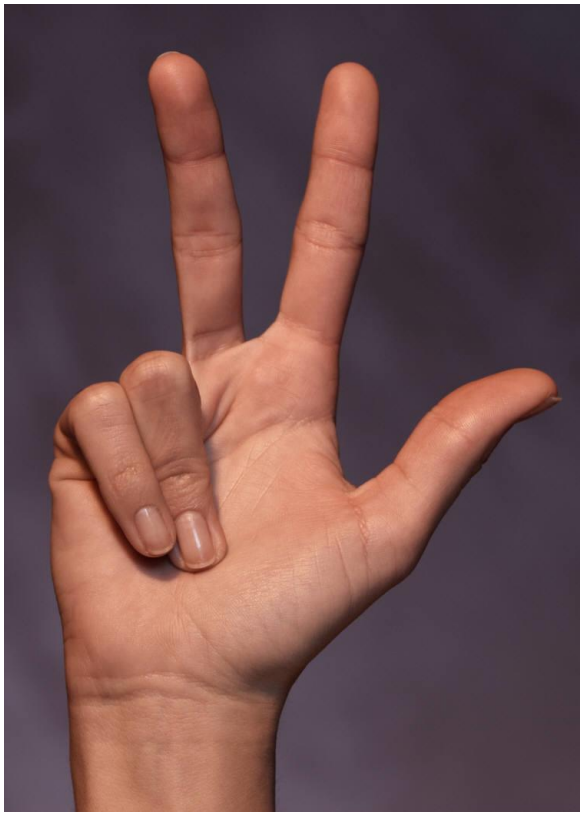
Human Factors Goals

1. Usability

2. Trainability

3. Maintainability



Solution Implementation

Verify Operational Readiness

Operational **Effectiveness**

How well does the solution satisfy the need?

Operational **Suitability**

How well will the product fit into the operation?

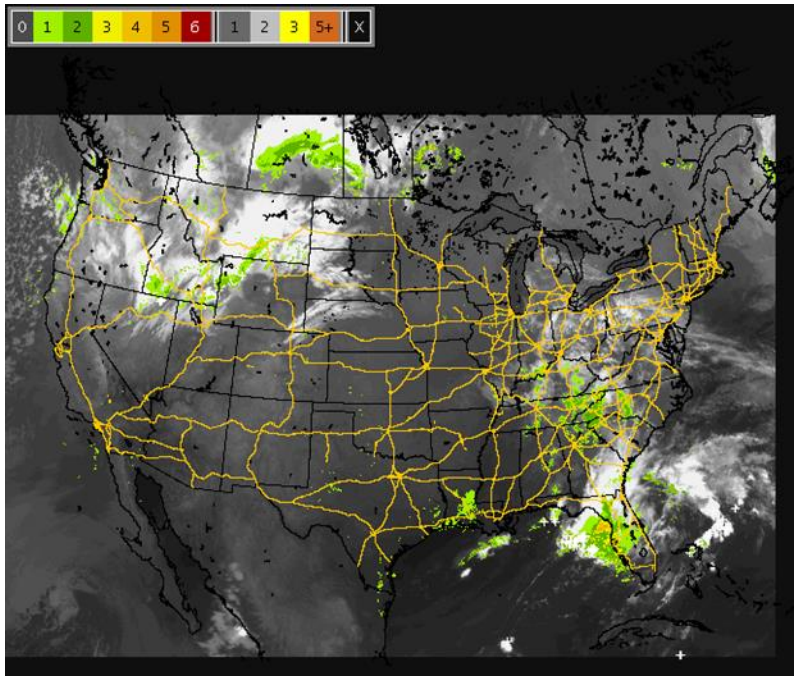
More than just meeting the requirements!

An Example…

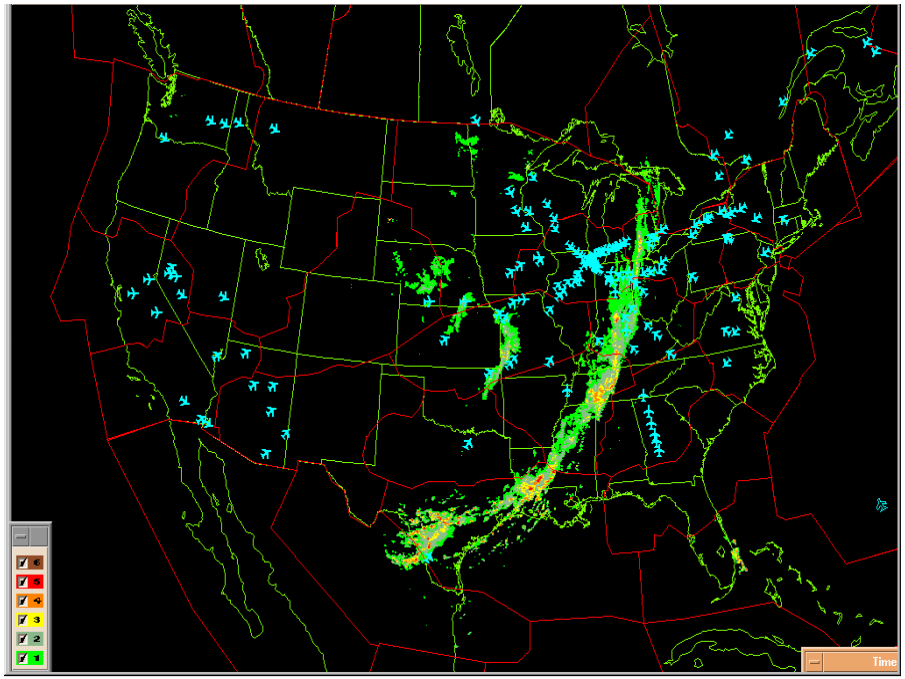
- Weather is responsible for much of the delay in the National Airspace System
- Traffic Managers plan and implement strategic initiatives for getting aircraft around weather

An Example…

Corridor Integrated Weather System



Traffic Situation Display
National Operational Weather RADar



“Just put it on the glass!”

It’s Not That Simple

Controls?

Distinguishing between weather products?

Conflicting Colors?

Legends?

Switching between weather products?

System Performance?

Human Factors In The Wild

How well does the solution satisfy the need?

Operational **Effectiveness**

Operational **Suitability**

How well will the product fit into the operation?

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Summation

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- Usability
- Trainability
- Maintainability

QUESTIONS ?

Eric Neiderman, Ph.D.
Tanya Yuditsky, Ph.D.

Aviation Research Division
William J. Hughes Technical Center
Atlantic City Airport, NJ 08405

E-Mail: Eric.Neiderman@faa.gov
Tanya.Yuditsky@faa.gov